ENVIRONMENTAL ASSESSMENT
RECLAMATION OF MINED LANDS
PROGRAM DENALI NATIONAL PARK AND
PRESERVE

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National Park Service
Denali National Park and Preserve

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I. PURPOSE AND NEED

The National Park Service (NPS) is proposing to reclaim and restore about 517 acres of mining disturbed floodplain and wetlands in 10 drainages in the Kantishna area of Denali National Park and Preserve. This 10-year plan (2001-2010) for reclamation and restoration of disturbed lands in the park and preserve will guide management decisions on implementing site-specific projects. The plan briefly identifies the level of restoration required in disturbed watersheds and outlines cultural resources management needs. All watersheds and proposed mine site reclamation areas in the Kantishna Hills area are shown on Figure 1.

The purpose of this action is to restore a natural appearance to the placer mining disturbed drainages, restore aquatic habitat, assist natural revegetation by eliminating abandoned equipment, buildings and debris used in past mining activities, recontouring washed gravel and boulder (tailings) piles, reconstructing channels and floodplains to restore the original flood capacity and function, redistributing available topsoil and fines, and planting native plants from park sources over the reclaimed areas. Recontouring of tailings piles, and reconstruction of stream channels and floodplains may involve the alteration of the existing active stream channel. This is necessary to encourage aquatic habitat recovery by stabilizing stream banks and providing cover for grayling and a food source for both aquatic and terrestrial insects. Reestablishment of floodplain vegetation in the Kantishna Hills would also provide habitat for a variety of birds and small and large wildlife.

While most of Denali National Park and Preserve is pristine wilderness, there are significant disturbed areas that require active restoration efforts to again become part of naturally functioning ecosystems. The effects of mining and mining access are visible on over 1,555 acres of land covering 10 drainages in the Kantishna area.

The adverse ecological effects of past placer mining on many creeks in Kantishna are multifaceted. Moving alluvial gravel to access and process the concentrated ore has eliminated the physical structure of stream and riparian ecosystems. Many of the characteristics of stream systems to which aquatic organisms are adapted are no longer present. For example, food sources such as riparian leaf inputs are gone in many places. Hydrologic characteristics, such as velocity profiles and channel stability, have changed significantly. Pool and riffle sequences, which are the gross physical habitat elements for stream fish, have been converted to long riffles with no pool habitat. The downstream channel bed has been altered so that interstitial spaces are filled with fine sediment, eliminating microhabitat.
This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the regulations of the Council on Environmental Quality (40 CFR 1500) and Department of Interior guidelines and policy.

BACKGROUND

The NPS Organic Act and the General Authorities Act prohibit impairment of park resources and values. The NPS Management Policies and Director's Order #55 use the terms "resources and values" to mean the full spectrum and intangible attributes for which the park is established and are managed, including the Organic Act's fundamental purpose and any additional purposes as

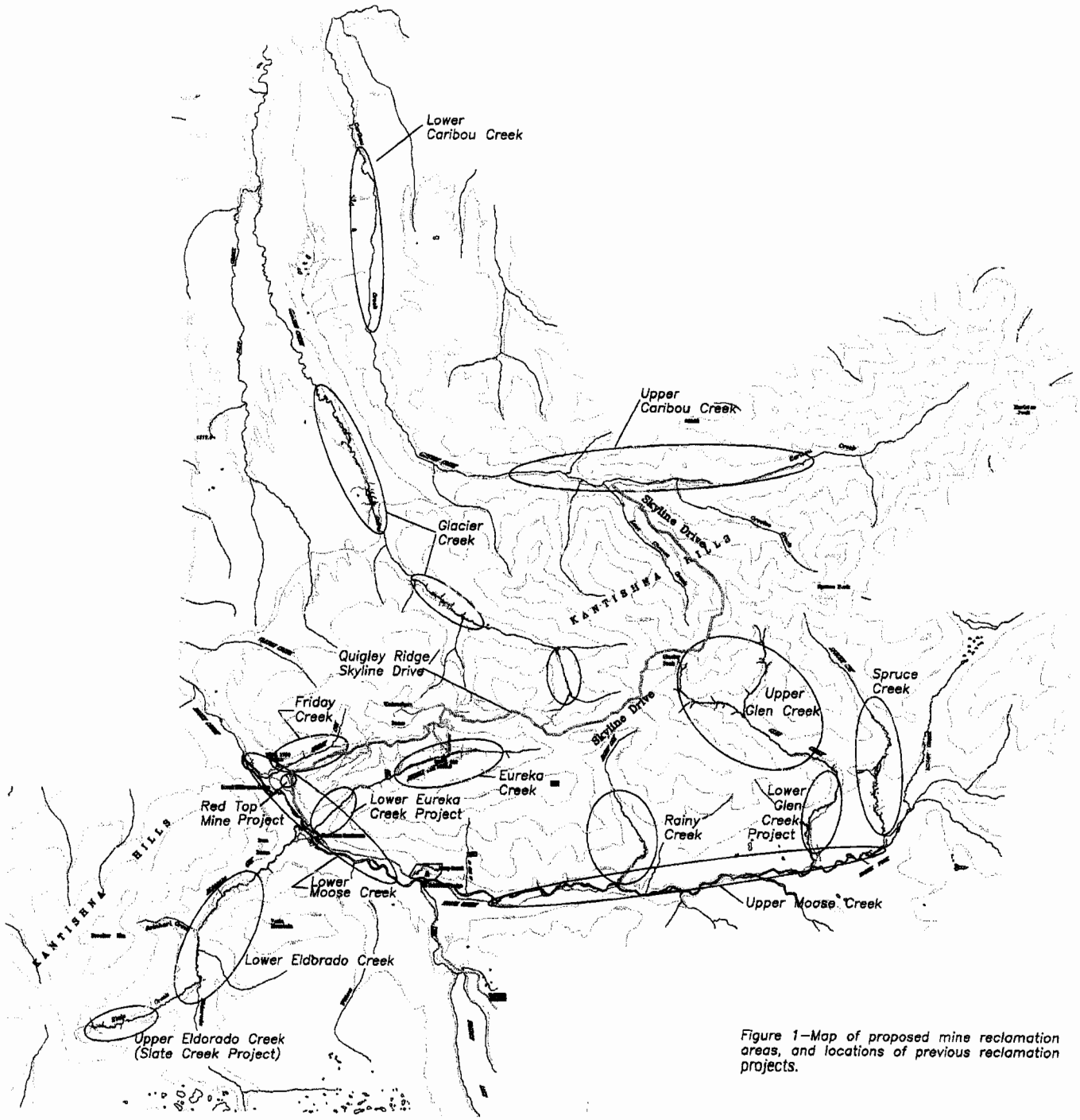

Figure 1—Map of proposed mine reclamation areas, and locations of previous reclamation projects.

stated in the park's establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the National Park Service is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The evaluation of whether impacts of a proposed action would lead to an impairment of park resources and values is included in this environmental assessment. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

On February 26, 1917, Congress established the original Mount McKinley National Park as ...a public park for the benefit and enjoyment of the people...as a game refuge...for the freest use...for recreation purposes by the public and for the preservation of animals, birds, and fish and...the natural curiosities and scenic beauties thereof."

In addition to specific park purposes and significance identified in the enabling legislation, the National Park Service Organic Act, which created the NPS on August 25, 1916, further specifies that the primary purpose is to manage system lands,

> To conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

In 1980 Congress passed the Alaska National Interest Lands Conservation Act (ANILCA), which President Carter signed on December 2, 1980. ANILCA, Section 202(3)(a) added about 3.8 million acres to Mount McKinley National Park and redesignated it as Denali National Park and Preserve to be managed for the following purposes:

> To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of fish and wildlife, including, but not limited to, bown/grizzly bears, moose, caribou, Dall sheep, wolves, swans and other waterfowl,; and to provide continued opportunities, including reasonable access, for mountain climbing, mountaineering and other wilderness recreational activities. Subsistence uses by local residents shall be permitted in the additions where such uses are traditional."

The Park General Management Plan (NPS 1986) addresses land ownership patterns and land protection priorities, in addition to other items such as park road traffic levels, access rights and methods, and wilderness suitability. The land protection plan section of this document lists the

acquisition of Kantishna surface estates as a top priority. It specifically describes the land protection objectives at Denali, which are to preserve and protect the park's natural and cultural values from the adverse effects of incompatible activities and to protect the visitor experience from intrusive development. Resources that are listed as particularly susceptible to damage and therefore most in need of protection are wildlife habitat, water quality, scenic quality, and recreational value.

Due to legal actions brought against the National Park Service, all mining essentially halted in the Kantishna Hills region at the end of 1985. The Record of Decision for the Final Environmental hnpact Statement on the Cumulative Effects of Mining in Denali (NPS, 1990) was signed by the Alaska Regional Director on August 21, 1990. This document called for an NPS Reclamation Program:

> Subject to the availability of funds, the National Park Service will pursue a reclamation program on disturbed mineral properties acquired by the United States, as well as on unreclaimed, abandoned, void, donated mining claims. Reclamation activities undertaken by the NPS will be guided by the same standards as applied to mining plans of operations. Reclamation site plans and environmental clearance documentation will be prepared prior to initiation of these activities."

The standards for reclamation are codified in the NPS regulations at 36 CFR Part 9 (A). These regulations require that a site be returned to a state of "natural conditions and processes."

In 1988, the National Park Service (NPS) began conducting long-term multi-disciplinary research on methods to promote riparian ecosystem recovery. The primary reclamation study site in Denali was a cluster of abandoned placer claims on lower Glen Creek in the Kantishna Hills. Various projects included studies of natural plant succession, the role of mycorrhizae and other soil microflora (Treu et. al, 1996), revegetation methods (Densmore, 1994), and benthic invertebrate populations (Major, 1996). Other studies initiated in 1990 focused on the research to develop stream restoration techniques which would (1) reduce erosion, (2) allow the stream to develop floodplains, sinuosity, and pools and riffles similar to premining conditions, and (3) minimize construction needs (Karle and Densmore, 1994). In 1991, a two-year project began in which two reaches of Glen Creek's stream channel and floodplain were restored. The project focused on channel and floodplain design criteria, and revegetation techniques.

Additional lode and placer mine sites have subsequently undergone some reclamation in the Kantishna Hills, based on results from the Glen Creek study. For example, an antimony mine site was reclaimed at Slate Creek. The two-year reclamation project (1997-98) focused on treating the acid mine drainage (pH 2.2). An anoxic limestone drain (ALD) was constructed on-site to treat the acid mine drainage. An underground geo-textile curtain was installed to capture and direct subsurface drainage to the ALD, which was constructed in a 2-cell configuration using 22,680 kg of limestone rock. Effluent from the ALD feeds into a small riparian wetland complex before draining into Slate Creek. Approximately 91 m of upper Slate Creek received bank stabilization treatments, including the use of coir bio-logs and fabric-encapsulated soil lifts. Finally, 1,000 alder seedlings were planted around the mine site area.

In 1999, two additional reclamation projects were completed. At the Red Top lode mine, reclamation action included an adit closure, treatment for mine drainage, and slope stabilization. At a nearby abandoned placer mine on lower Eureka Creek, a mining camp and assorted debris was disposed of, hazardous materials were removed, and a section of stream channel and floodplains were totally rebuilt, using guidelines and methods developed on Glen Creek.

ISSUES

Issues and impact topics are identified and form the basis for environmental analysis in this EA. A brief rationale is provided for each issue or topic that is analyzed in the environmental consequences section.

Water Quality

- Stream channel and floodplain reconstruction could impact water quality; heavy equipment could decrease water quality during stream crossings.
- Non-point source pollution, such as turbidity, should decrease as a result of increased bank stability along reclaimed channels.

Wetlands and Floodplains

- Heavy equipment operation would impact some areas of riparian and scrub shrub wetlands that have re-established since mining operations stopped.
- Reclamation activities would result in the creation of functional floodplains adjacent to stream channels, by removing the channel from an incised condition and allowing adjacent areas to flood during high water.

Vegetation

- Vegetation that has reestablished on tailing piles and mined floodplains may be destroyed by reclamation activities.
- The time frame for riparian vegetation reestablishment will be shortened considerable by reclamation activities.

Wildlife

- Borrow site activities could disturb or displace wildlife (caribou, grizzly bear) and alter their movements and habitat use of the area.
- Reclamation activities could improve wildlife habitat in the Kantishna area.

Fisheries

- Re-establishment of a functional riparian zone, along with the installation of in-stream structures, would improve fish habitat and lead to an increase in fish populations in some watersheds.

Cultural Resources

- Mine reclamation activities could potentially affect currently unknown cultural or historic resources.

Visitor Use and Recreation

- Mine reclamation activities would result in impacts to visitor use, visitor safety, and accessibility.
- There could be degradation of the park visitor experience in the Kantishna Hills area due to visual and/or noise intrusions from NPS helicopter or backcountry field operations.

Park Management

- This plan would result in compliance with important park and agency management guidelines, policies and regulations, including the Record of Decision for the Final Environmental Impact Statement on the Cumulative Effects of Mining, the Denali General Management Plan, and others.

Subsistence

- Sites chosen in the park additions could affect subsistence use activities (See also Appendix C)

ISSUES ELIMINATED FROM FURTHER CONSIDERATION

Threatened and Endangered Species

The Endangered Species Act requires an analysis of impacts on all federally listed threatened and endangered species, as well as species of special concern. In compliance with Section 7 of the Act, the U.S. Fish and Wildlife Service (USFWS) has been consulted. No Federally designated threatened or endangered species are known to occur within Denali National Park (pers. comm. Ted Swem, USFWS, Fairbanks, Alaska, June 9, 2000), and none are anticipated to be affected by this plan.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,* requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. This plan is not expected to result in significant changes in the socioeconomic environment of the area, and therefore is expected to have no direct or indirect impacts to minority or low-income populations or communities.

Wilderness

None of the project areas or watersheds in the Kantishna Hills region are in designated wilderness. All project areas are in an area found to be not suitable for wilderness designated by the DENA General Management Plan in 1986. Additionally, no noise generated by project activities is expected to affect solitude in any adjacent wilderness areas.

PERMITS AND APPROVALS NEEDED TO COMPLETE THE PROJECT

Table 1 provides a list of environmental permit and reviews required for individual reclamation projects. A Corps of Engineers Clean Water Act 404 Permit is required for any part of a project that traverses the waters of the United States, including wetlands. An EPA National Pollutant

Discharge Elimination System (NPDES) permit may be required for storm water, non-point discharge under the Clean Water Act 402. Also where any road crosses a water body with fish, the Alaska Department of Fish and Game requires a Fish Habitat Permit. The Alaska Department of Environmental Conservation issues a Certificate of Reasonable Assurance under authority of the Clean Water Act Section 401 for any project that would affect five or more acres of wetlands.

II. DESCRIPTION OF THE ALTERNATIVES

Alternative 1-Reclamation Plan (Preferred Alternative) (Environmentally Preferred Alternative)

Alternative 1 (Preferred Alternative) is a 10-year plan to reclaim and restore about 517 acres of disturbed floodplain and wetlands in 10 drainages in the Kantishna area. Areas to be reclaimed include portions of Eldorado Creek, upper and lower Moose Creek, Spruce Creek, Rainy Creek, upper Glen Creek, Caribou Creek, Glacier Creek Friday Creek, Eureka Creek, Crooked Creek, and Quigley Ridge. All watersheds and proposed mine site reclamation areas are described in Appendix A and are delineated on Figure 1. Table 2 is a summary table showing a range of activities and amounts that would occur in each of the areas listed in Appendix A.

The Preferred Alternative includes the disposal of all non-historic buildings, equipment and debris, the recontour of tailing piles, filling of exploration trenches, scarifying compacted areas, reconstruction of stream channels and floodplains, and redistribution of available fines and topsoil in several watersheds in the Kantishna Hills area of Denali National Park and Preserve. In addition, natural revegetation would be assisted by collecting and dispersing seed from local sources and by planting native shrub and tree cuttings from adjacent areas. Reclamation projects involving streams or upland sites would generally require the following actions:

Access to the sites

Two of the claim groups (Lower Caribou Creek and Lower Glacier Creek) are not accessible via the constructed road system and would require winter access using heavy equipment over frozen, snow-covered ground, or heavy lift helicopter operations to prevent undue degradation to vegetation, soils and water resources. All other sites are accessible via constructed roads (shown in black on Figures 2-5). Access to individual reclamation sites would vary, depending on the watershed in Kantishna. An 8-mile old mining road, which runs along upper Moose Creek, serves as access for vehicles and heavy equipment to Rainy Creek, Glen Creek, and Spruce Creek (smaller roads run from the Moose Creek road up each individual watershed). Up to 24 stream crossings are required along this route, depending on the destination. Access to Friday Creek, lower Eureka Creek and middle Moose Creek would be gained from the main park road between the park boundary and the Kantishna airstrip. Access to upper Glacier Creek, Yellow Pup, and upper Caribou Creek would be gained via the Skyline Drive mining road, a 15-mile

Table 1: Environmental permit and reviews required for individual reclamation projects.

Regulated Activity (Required Permit/Approval)	Regulatory Agency	Authority	Description
Discharge of dredged or fill material into U.S. waters, including wetlands (USACE Fill Permit)	USACE/EPA	Section 404, Federal Water Pollution Control Act of 1972, as amended in 1977 Clean Water Act (33 USC 1344)	The Corps of Engineers must authorize the discharge of fill material in U.S. waters, including some wetlands.
Discharges to waterways by storm water (National Pollution Discharge Elimination [NPDES] System)	EPA	Section 402, Clean Water Act (40 CFR Part 122.26)	Any construction activity over 5 acres including grading, clearing, excavation, or other earth moving process may require an NPDES storm water permit
Development possibly affecting historical or archeological sites (Review and Comment)	Advisory Council on Historic Preservation (ACHP)	National Historic Preservation Act of 1966, as amended (16 USC 470)	ACHP must be given reasonable opportunity to review and comment on the adequacy of the management plan for historic or archeological sites potentially impacted by any federally permitted or funded project.
Development possibly affecting historical or archeological sites (Cultural Resources Concurrence)	Office of History and Archeology/ State Historic Preservation Office	National Historic Preservation Act of 1966, Alaska Historic Preservation Act	For any federally permitted, licensed, or funded project, the SHPO must concur that cultural resources would not be adversely impacted, or that proper methods would be used to minimize or mitigate impacts.
Occupancy and modifications of floodplains (NPS Floodplain Management Guidelines-Statement of Findings)	NPS/all federal agencies	Executive Order 11988 (Floodplain Management) 1977	NPS and all federal agencies must avoid to the extent possible adverse impacts associated with occupancy and modifications of floodplains, including direct or indirect support of floodplain development, whenever there is a practicable alternative.
Destruction or modification of wetlands (NPS Wetlands Protection Guidelines-Statement of Findings)	NPS/all federal agencies	Executive Order 11990 (Protection of Wetlands) 1977	NPS and all federal agencies must avoid to the extent possible adverse impacts associated with occupancy and modifications of floodplains, including direct or indirect support of floodplain development, whenever there is a practicable alternative.

Table 2: Summary table showing a range of activities and amounts that would occur in each of the areas listed in Appendix A.

Mine Reclamation Sites	Type of Reclamation Activity	Size of Activity
Eldorado Creek	Channel stabilization	1-2 miles
	Revegetation of floodplains, slopes	5-25 acres
	Settling pond/ test trench filling	< 1 acre
Upper Moose Creek	Revegetation of floodplains	1-5 acres
	Tailing piles recontouring	1-5 acres
Lower Moose Creek	Channel stabilization	1-2 miles
	Revegetation of floodplains	2-5 acres
Spruce Creek	Channel stabilization	0.2-1 mile
	Tailing piles recontouring	1-2 acres
	Revegetation of floodplains, slopes	5-10 acres
Rainy Creek	Channel stabilization	0.2-0.5 mile
Upper Glen Creek	Channel stabilization	2-5 miles
	Revegetation of floodplains, slopes	100-300 acres
	Road reclamation, stabilization	2-5 miles
Caribou Creek	Channel stabilization	4-8 miles
	Revegetation of floodplains, slopes	100-200 acres
	Tailing piles recontouring	10-20 acres
	Road reclamation, stabilization	1-3 miles
Glacier Creek	Channel stabilization	1-3 miles
	Revegetation of floodplains, slopes	25-50 acres
	Road reclamation, stabilization	2-5 miles
Friday Creek	Channel stabilization	0.1-0.5 mile
	Revegetation of floodplains, slopes	1-5 acres
	Road reclamation, stabilization	1-2 miles
	Tailing piles recontouring	1-2 acres
Eureka Creek	Revegetation of floodplains, slopes	5-10 acres
	Road reclamation, stabilization	1-2 miles
	Tailing piles recontouring	2-3 acres
Crooked Creek	Tailing piles recontouring	0.5-1 acre
Quigley Ridge	Road reclamation, stabilization	5-8 miles
	Tailing piles recontouring	0.5-1 acre

road that starts from the park road at Mile 92. Access to Eldorado Creek and Slate Creek would be gained by crossing Moose Creek just downstream from the Kantishna Roadhouse and traveling along a bladed trail, which crosses Eldorado Creek numerous times. The roads mentioned above would support the travel of large heavy equipment, such as bulldozers, as well as 4x4 trucks, pick-up trucks, and 4-wheelers.

Access to some sites may require the use of a helicopter. Helicopters are used during reclamation projects to transport people, supplies, debris, lumber, and fuel barrels. Remote landing sites are mostly unimproved and flights are often of very short duration, covering two to eight miles. For this reason, and due to frequent low cloud ceilings, the helicopter typically operates below the FAA recommended 2,000-foot minimum altitude for park overflights.

Field camp operations

Because of the remote locations of sites needing reclamation projects, remote field camps are used to house work crews on-site during projects, thereby reducing truck and helicopter travel. An existing centrally located camp at Friday Creek would be used as a staging area for projects in other, more remote locations, such as Caribou Creek. The Friday Creek camp is designed to accommodate up to 20 persons but its average use is 12 to 20. Field occupancy of the camp would not begin before June 1 nor extend past September 30. Lodging is provided by 8 X 10 foot platform wall tents and 8 X 10 foot portable fabric-covered white Quonset-type tents on portable wooden floors. A larger 15 X 20 foot portable fabric Quonset-type building serves as a kitchen and dining hall. This building would be enclosed by an eight-foot high chain link fence to reduce the opportunity for bear/wildlife contact with camp food. All food in the camp, including personal snacks and hygiene supplies are stored within the bear exclosure.

Water would be supplied from a pump located on Friday Creek just above the camp. Water would be pumped, filtered and stored above ground; in a 500-gallon fiberglass storage tank. Water is plumbed to a sink in the kitchen/dining hall facility and a shower stall in an adjacent structure. Two vault toilets would be utilized for human waste. Solid waste materials would be double-bagged, stored inside the fenced exclosure and hauled to a Park contracted garbage pickup point either in Moose Creek Pit or at Wonder Lake Ranger Station. Gray water from the kitchen would be piped to the vault toilets.

Smaller 'spike' camps would be set up at particular project locations. These camps are much more temporary in nature; they would be constructed at the beginning of an individual watershed project, and removed immediately following the project completion. Lodging would be provided either by 8 X 10-foot platform wall tents, or by large nylon self-supporting tents. An electric bear fence, powered by a solar charger would be erected and maintained around the kitchen tent. This type of fence, designed specifically for bears, worked effectively at a similar camp on Slate Creek in 1998. A pit toilet would be utilized for human waste at each site. Upon cessation of activities these field camps would be dismantled and removed from the site. All human-made debris and equipment would be collected and removed. The fence around the kitchen would be dismantled and removed. All excavations would be backfilled and the site rehabilitated.

Small staging areas for equipment maintenance and fueling would be set up near the spike camp locations. Diesel fuels for equipment use would be contained in new 55-gallon barrels, and stored within a containment system. Spill kits would be stored adjacent to fueling area, and would be used if a spill of fuels or oil occurred. Field crews would be trained in the prevention of spills, use of spill kits, and reporting requirements for such spills. Absorbent pads would be used each time a piece of heavy equipment is fueled, to prevent small spills and leaks. All excess fuels, used engine oil, and other fluids would be removed from the project site, and returned to park headquarters for proper storage or disposal.

Abandoned equipment and debris cleanup

Though extensive work has been accomplished in the past ten years, a few sites around the Kantishna Hills have abandoned debris and equipment that the NPS proposes to remove and dispose of or recycle by 2010. A crew of 6-9 persons (including NPS environmental and cultural resources monitors) would operate over a 2-4 week period each summer utilizing a helicopter, and assorted heavy equipment to remove debris and equipment from acquired and abandoned mining properties. Wood and other burnables would be incinerated onsite whenever possible. Material at remote sites would be moved by helicopter sling operations to a central staging area near the Kantishna airstrip. There, a loader would fill commercial dumpsters with segregated recyclable metals and trash that would be transported by commercial truck to disposal sites in Fairbanks and Anchorage.

Reclamation planning and research

Reclamation site inventories would be conducted for approximately two weeks each year by a 3 to 4 person crew. The crews would initially fly over disturbed historic mining areas to obtain oblique aerial photos and orientation to the overall site. The overflight would be followed by a ground traverse of the disturbance sites and adjacent undisturbed vegetation collecting ground photos, making measurements, mapping disturbance categories, completing inventory sheets and obtaining samples of vegetation, soils and water.

Reclamation research would also continue in the Glen Creek watershed with annual monitoring of previous work. Monitoring typically involves 1-2 persons measuring plant growth, abundance and survival at research plots for several weeks each season, and surveying permanent channel cross-sections.

Project success may be measured by using techniques developed at Glen Creek. Such techniques, including plant measurements and channel cross-section surveys, are used to assess habitat improvements and slope and channel erosion reduction. Due to the expense and time consumption of these measurements, other techniques may be used to measure project success. These include repetitive aerial photograph, and ground photography using permanent photo points. Monitoring would occur at some level in the project areas to measure the success of the reclamation work.

Channel and floodplain reconstruction

This is generally the most significant action of the reclamation program. Mined stream channels suffer commonly from two conditions, either incision and constant downcutting and erosion, or widening with continual aggradation and braiding. Sinuosity (channel length/valley length) is reduced to close to 1. To correct the channel's instability and return the channel/floodplain complex to a functioning system, a new system often needs to be constructed, using heavy equipment to carve out a new channel and floodplain. The design process is complex, involving advanced hydraulics and hydrology, and will not be explained in this document. Once the project engineer has completed the design, the watershed would be surveyed and the design would be staked out on the old floodplain.

Heavy equipment, including bulldozers, front loaders, excavators, and dump trucks would be used to move the earth to the new design configuration. This includes excavating new channels, filling old channels, leveling tailing piles, and pushing excess material up against valley walls. Upon completion of the earthwork, some actions would be required to reduce channel and bank erosion until revegetation occurs. These measures generally include installing coconut fiber biologs on the outside channel bends, using bio-degradable erosion control blankets on slopes, and planting willow cuttings and alder seedlings in bare areas. Commercial nurseries may be utilized to provide seedlings from seeds taken only from the surrounding project area. Willow cuttings would be taken from the surrounding area; care would be taken to carefully select the extent and timing of cutting during such operations; sensitive areas (low potential for regrowth) would be avoided.

Project Schedules and Timing

Reclamation activities as described above would take place in the summer months, between June 1 and September 15. The length of any particular project would depend upon the complexity of the action required. For example, a simple slope stabilization may take 2 weeks, whereas a large channel/floodplain reclamation project may occur over the entire summer period.

The 10-year schedule for the project activities described in this EA is dependent on two factors: claim ownership and funding. The intent of the National Park Service is to acquire all mining claims and inholdings where willing sellers exist. However, many of the claims in the watersheds listed in Appendix 1 are still owned by private parties. Work would not begin on these properties unless and until they are acquired by the National Park Service. Additionally, funding for reclamation projects is generally received on an individual basis, after substantial review by local, state, and national NPS funding committees. Projects generally must compete nationally for funding priority; project funding requests are submitted at least one year in advance of the anticipated project. At the time of this writing, funding has been received to conduct reclamation activities in upper Caribou Creek during the 2001 and 2002 summers, and to conduct a general debris cleanup throughout Kantishna during the 2001 and 2002 summers. Funding has been requested for a reclamation project in Glacier Creek for 2002-2004. No schedule has been developed yet beyond these three projects.

Alternative 2-No Action

The no-action alternative would result in no mining reclamation program. The 10-year plan to reclaim and restore about 517 acres of disturbed floodplain and wetlands in 10 drainages in the Kantishna area would not be undertaken. Portions of Eldorado Creek, upper and lower Moose Creek, Spruce Creek, Rainy Creek, upper Glen Creek, Caribou Creek, Glacier Creek Friday Creek, Eureka Creek, Crooked Creek, and Quigley Ridge identified in Alternative 1 would not be reclaimed.

III. AFFECTED ENVIRONMENT

The area affected by the proposed action has been inventoried, described and mapped to document vegetation, wildlife, cultural resources, surface hydrology, existing disturbance and other parameters for a variety of previous environmental review efforts.

Information specific to the areas affected by the proposed action is contained in several publications, most notably, the Final Environmental Impact Statement, Cumulative Impacts of Mining, prepared for Denali National Park and Preserve which was released in May 1990. This and other reports are identified below. These reports are incorporated herein by reference. These documents are available for review in the offices of the Physical Resources Division at the NPS Alaska Regional Office in Anchorage or at Denali Park Headquarters.

1981 Environmental overview and analysis of mining effects: Denali National Park and Preserve.

1982 Fish resources and the effects of mining activities in the Kantishna Hills, Denali National Park, 1982. Scott Meyer and Ross Kavanaugh.

1984a Water quality and the effects of mining activities in the Kantishna Hills, Denali National Park, 1983. Nancy Deschu and Ross Kavanaugh.

1984b Wildlife and the effects of mining activities in the Kantishna Hills, Denali National Park and Preserve. Research and resource management report AR-2. Ken Kertel.

1984c Kantishna Hills/Dunkle Mine study report: final environmental impact statement. Denali National Park and Preserve.

1986a Environmental assessment-access to the Caribou-Howtay Association 1-11 claims on Caribou Creek, Kantishna Hills, Denali National Park and Preserve. FONSI dated May 7, 1986.

1986b Environmental assessment-access to the Lee Bench Howtay Association No. 4 claim on Caribou Creek, Kantishna Hills, Denali National Park and Preserve. FONSI dated May 14, 1986.

1987a Environmental assessment-temporary field camp at Friday Creek, Kantishna Hills, Denali National Park and Preserve. FONSI dated June 1, 1987.

1987b Environmental assessment-mineral examination and access, Lee Bench/Howtay claims, Denali National Park and Preserve.

1990 Final environmental impact statement, cumulative impacts of mining, Denali National Park and Preserve.

To summarize these documents, the Kantishna Hills lie 2 to 10 miles north of the Alaska Range and are separated from the higher terrain of the Alaska Range by the McKinley River and the Clearwater Fork of the Toklat River. The region is bordered on the west and northwest by the Kantishna-McKinley River basins. This area is in the continental climatic zone of Interior Alaska. The summers are cool because of a strong maritime influence and high elevations. Most summer and winter storms bringing moisture to the Kantishna Hills arrive from the southwest.

Primary access to the Kantishna Hills is on the 92 mile long Denali Park road, which continues approximately 5 miles past Wonder Lake to the airstrip, about 1 mile past the Kantishna Roadhouse. Roughly 75 miles of new roads and trails were developed as necessary for access to mining claims. Most of these roads and trails require four-wheel drive vehicles and high clearance or all-terrain vehicles. Another means of access to Kantishna is by aircraft.

Vegetation: Because of the wide variety of topographic relief in the Kantishna Hills, most plant communities typical of the Alaska taiga are represented. Plant communities were classified into five major types of cover, and percent of cover: Floodplain forest (1.5%), Upland forest (22.7%), Tall shrub (18.3%), Low shrub (46.6%), and Alpine tundra (9.4%). No threatened or endangered plant species occur in the Kantishna Hills. The vegetative cover is sparse or absent on previously mined ground. Tailings piles are sparsely revegetated with stands of tall willows, and recent overburden piles at the edges of barren mined areas support the regrowth or germination of successional species of shrubs, grasses, sedges, and herbs. Vegetative recovery is slow where rocky, overturned soil remains after mining.

Wetlands: Wetlands occur throughout the Kantishna Hills study area. A few, small shallow ponds occur along the low plateaus between Moose, Caribou and Glacier Creeks. These areas are underlain with intermittent permafrost and support moist tundra and stunted black spruce forest communities where drainage is restricted and thick organic soils occur.

Streams in the Kantishna Hills are generally fed by clear waters derived from rain, snowmelt, and subsurface aquifers. These clearwater streams are unique within the park and are particularly important to local fisheries. Mining activities have altered the stream morphometry on parts of 13 drainages in the Kantishna Hills. These disturbed streams and stream sections characteristically lack riparian vegetation and have channelized stream courses, altered substrate composition, and increased sediment runoff from disturbed areas. Up to 90 percent of the length of some streams has been disturbed. Stream sections with extensive disturbance generally contain the lowest quality fish habitat. Species documented in these streams are arctic grayling, slimy sculpin, round whitefish, chinook salmon, chum salmon, coho salmon, sheefish, and northern pike. Arctic grayling and slimy sculpin are the most abundant and widespread species.

Wildlife: Large wildlife resources in the Kantishna Hills include grizzly bears (unknown densities), black bears (more abundant than grizzly), moose (abundant), caribou (erratic use by Denali herd), and wolves (intermittent use by packs). Small mammals and numerous bird species utilize the riparian habitat along the streambanks. No species of plants or animals listed as threatened or endangered are known to occur in close proximity to any of the Kantishna watersheds.

IV. IMPACTS OF THE ALTERNATIVES

This impact analysis evaluates the potential effects of implementing the mine reclamation program for the 2001 through 2010 field seasons. It discusses only those concerns identified during the scoping phase of this analysis as addressed in the section IMPACT TOPICS.

ALTERNATIVE 1- RECLAMATION PLAN (Preferred Alternative) (Environmentally Preferred Alternative)

Water Quality

Certain projects would require substantial changes to the existing stream channel and floodplain, in order to create a stable system. Hydraulic analyses conducted during the design phase of a stream restoration project would show that often, the channel needs to be either deepened, narrowed, and placed in a more sinuous configuration, or removed from an incised condition. To achieve this design, a new channel is excavated at the site, along with an associated floodplain. When new channels are opened and water begins to initially flow down them, the potential is great for extremely high sediment transport and turbidity. A sediment plume may be evident for several thousand feet downstream from a newly created and operational stream channel. Typically, these discharges last less than 12 hours before the water again flows clearly. However, techniques would be used to insure the sediment from such projects will be minimized. Sediment traps, consisting of heavy gaged mesh and coconut or coir fiber material, would be placed across the channel in numerous locations throughout the new channel section. These temporary devices act to slow down waters and drop sediment out during the first 24 hours of water flow through a new section. After several days, the coarse sediment trapped behind these devices is removed from the channel using a suction dredge, and the filter material is likewise removed and disposed of off-site. Some fine sediment and turbidity is expected to escape downstream during this operation, but these discharges are expected to be small, and have little effect on aquatic habitat more than 1,000 feet downstream of the work area. Up to 22 miles of stream channel would be stabilized.

Access along Moose Creek, Caribou Creek and other creek roads would require occasional creek crossings with a tracked backhoe, bulldozer, and rubber-tired trucks. Such crossings disrupt small amounts of stream sediments and wash dirt off vehicle tires, tracks, and undercarriages. This causes a small sediment plume to form behind the vehicles and a temporary and localized increase in turbidity to occur. The use of high clearance vehicles and minimizing crossings with the dozer minimize these impacts.

Frequent vehicle use at the crossings would also results in some stream bed compaction, depressions and bank alterations. Experience shows that the in-stream impacts are quickly mitigated by stream dynamics.

Cumulative Effects: Impacts to water quality in the areas where reclaimation would be proposed has resulted from past mining activities. Long-term effects of sedimentation and turbidity would continue to occur on unstabilized stream channels during high water events. The contribution to cumulative impacts to water resources from the proposed NPS activities are considered inconsequential because of their small size, temporary nature, and infrequent occurrence.

Conclusion: Overall, the temporary minor adverse impacts on water quality resulting from the various reclamation activities would be considered to be acceptable, given the long-term positive results expected from the program. The level of impacts to water quality anticipated from this

alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Wetlands and Floodplains

Wetlands are distributed throughout many of the project sites. Though many were destroyed during mining operations, some areas have recovered naturally. Reclamation activities, using heavy equipment, may impact some of these new 'wetlands' areas in the process of restoring naturally functioning wetlands and floodplains. Wetland delineation, and individual Section 404 Corps of Engineers permits if required, would be completed. In some project areas, new wetlands would be created as part of the overall restoration process. Additionally, floodplain function, up to 300 acres, would be restored in many areas. This occurs when channels are removed from their incised condition during reshaping. By lowering the floodplain level relative to the active channel, flood waters are allowed to escape the channel, which decreases channel erosion and allows sediment deposition on the floodplain. In general, the benefits of creating and rehabilitating of wetlands and floodplains during mine reclamation projects outweigh any of the impacts of wetlands and floodplain disturbance and impact by heavy equipment operation. Additional discussion of floodplains and wetlands is found in Appendix B.

Cumulative Effects: Wetlands in many of the project sites have been destroyed during prior mining operations., the contribution to cumulative impacts to wetlands and floodplains from the proposed NPS activities are considered inconsequential because of their small size, temporary nature, and infrequent occurrence.

Conclusion: Overall, the temporary minor adverse impacts on wetlands and floodplains resulting from the various reclamation activities would be considered to be acceptable, given the long-term positive results expected from the program. The level of impacts to floodplains and wetlands anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Vegetation

Mining operations generally denuded large areas of all vegetation on both placer and lode claims. However, some mined areas, especially on tailing piles containing original overburden and organic soil, have begun to revegetate because of natural processes. This vegetation generally consists of alder, willow, and some grasses. Because of the necessity to recontour tailing piles and slopes to reduce erosion potential and reestablish natural conditions during a reclamation project, it is likely that some vegetation will be destroyed during these projects. However, up to 610 acres in all watersheds would undergo assisted revegetation efforts.

Cumulative Effects: Mining operations have contributed the vast majority of effects to vegetation generally by denuding large areas of vegetation on both placer and lode claims. The contribution to cumulative impacts to vegetation from the proposed NPS activities would be considered inconsequential because of their small size, temporary nature, and infrequent occurrence.

Conclusion: Overall, the temporary minor adverse impacts on vegetation resulting from the various reclamation activities are considered to be acceptable, given the long-term positive results expected from the program. The level of impacts to vegetation anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Wildlife

Experience and observation by field crews operating in Kantishna for the last fifteen years indicates that the greatest potential impact to wildlife from the proposed action would be temporary, short-term disturbance and displacement of wildlife during access operations. Although infrequently, wildlife, particularly caribou, have been encountered along access routes to various watersheds on the local road net. In areas of open vegetation, the caribou typically move away from the road and continue their same course of travel. On road stretches lined with dense vegetation, caribou often respond to vehicle traffic by trotting along the track until they find a clearing large enough for them to break free of the road. Bears and small mammals typically respond in the same manner. Because of the Park's protected environment, the stress to the animal would seldom greater than that required to move to a new place of safety.

Any field camp, helicopter operations and field crew activities would also have the potential of temporarily disturbing or displacing wildlife. Wild species, by their nature, tend to avoid humans regardless of the potential threat. Wildlife would likely avoid camp areas and areas where field activities are taking place if other habitat or routes of travel are available.

Temporary camps used during reclamation activities would enforce stringent policies on food storage, handling and disposal practices, and NPS restrictions and training on feeding or harassing wildlife. Camps would be required to install an 8-foot chainlink fence or electric fence exclosure, and would be sited if possible in areas with less likelihood of bear encounters. Field crews are trained annually in bear behavior and firearm alternatives such as cayenne pepper spray to provide personal protection in the unlikely event of an aggressive bear encounter.

Mountainous terrain and short flight distances dictate that helicopter flight operations are often conducted at 500 feet above ground level or less. Whenever wildlife are observed from the air and the helicopter is operating at low flight altitudes, the flight path is altered if possible to avoid flying directly overhead. Often, conditions do not permit such alterations of the flight path. When possible, flights are conducted 1,000 feet above the terrain to reduce wildlife disturbance. Restricted flight zones are placed around raptor nesting sites and pilots are restricted from deviating flights to observe wildlife.

Cumulative Effects: Wildlife habitat in the proposed project areas has been altered primarily by past mining activities that include destruction of wetlands and floodplains, loss of terrestrial and riparian vegetation.The contribution to cumulative impacts to wildlife from the proposed NPS activities would be considered inconsequential because of their small size, temporary nature, and infrequent occurrence.

Conclusion: Overall, short and long-term adverse impacts to wildlife and wildlife habitat resulting from stream and mine reclamation projects are considered to be minor. The long-term positive benefits of restoring previously disturbed habitat outweigh the short-term disruption and displacement of some individuals. The level of impacts to wildlife anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Fisheries

Minor short-term reduction of fish populations would occur. This would result from impacts to stream channels as they are reclaimed using heavy equipment. In addition to physical alteration of the channel, turbidity increases during and shortly after construction would result in the clogging and/or cementing of streambed gravels used for spawning. Up to 22 miles of stream channel would be stabilized. Stream channel construction would included features for fish habitat, including pools, overhanging banks, and others. Additionally, a reclaimed riparian zone would increase stream bank vegetation, which would improve fish habitat by providing cover, food, and lowering water temperatures.

Cumulative Effects: Fish habitat in the proposed project areas has been altered primarily by past mining activities. Fish habitat has been degraded by the physical alteration of stream channels (loss of pools and overhanging banks), increased turbidity, and a loss of stream bank vegetation.The contribution to cumulative impacts to fisheries and fish habitat from the proposed NPS activities are considered inconsequential because of their small size, temporary nature, and infrequent occurrence.

Conclusion: Overall, short and long-term adverse impacts to fisheries and fish habitat resulting from stream and mine reclamation projects are considered to be minor. The long-term positive benefits of restoring previously disturbed habitat outweigh the short-term disruption and displacement of some individuals. The level of impacts to fisheries anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Cultural Resources

Many of the disturbed areas slated for reclamation have been mined several times since the early 1900s. Although older claims that have not been mined in the past 50 years are often naturally re-vegetated and fairly stable, some reclamation activities may impact historic features. Reclamation plans would be coordinated with cultural resource specialists to avoid inadvertent damage to culturally significant items or areas. When cultural resources are located and mapped, it is often possible to design reclamation work to avoid these sites. Cultural resource specialists would be consulted early during the site planning and reclamation design process.

Cultural resources in disturbed areas of the park are divided into three categories: 1. Must be maintained and preserved, 2. Should be maintained and preserved, and 3. May be maintained and preserved. Classification of cultural resources into one of the three categories above is based on information contained in the report, 'Overview and assessment of archeological resources,

Denali National Park and Preserve, Alaska (NPS, 1990). Extensive cultural resources information was gathered in response to the 1985 federal court decision that required the NPS to evaluate the effects of mining upon both natural and cultural resources in the park.

Cumulative Effects: Because the cultural resources in the Kantishna Hills have been mapped extensively, and close coordination with cultural resource specialists is required for this program, the contribution to cumulative impacts to cultural resources from the proposed NPS activities are considered inconsequential. There may be minor long-term adverse impacts to cultural resources that were not discovered or mapped during reconnaissance efforts.

Conclusion: Overall, the low likelihood of impacts on unmapped or undiscovered cultural resources resulting from the various reclamation activities are considered to be acceptable, given the long-term positive results expected from the program. The level of impacts to cultural resources anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Visitor Use and Recreation

The presence of work camps, access operations along Moose Creek, flight operations in the vicinity of Kantishna, vehicle and heavy equipment travel along Skyline Drive, fueling and staging operations at the Kantishna airstrip, heavy equipment and other vehicle travel on the Park road, personal property relocation activities, visual intrusions from survey markers, smoke from debris burning and encounters with field crews during backcountry travel all have the potential of affecting the experience of park visitors in Kantishna or surrounding back country areas.

Such impacts are generally of a short-term, qualitative nature and are dependent upon a visitor's expectations and the extent and type of exposure to a visual or noise intrusion. Some visitors would occasionally observe or hear the helicopter, which at times may be at close distances. Visitors who are at or near the airstrip when the helicopter comes in to refuel would be subjected to a noisier and more direct short-term intrusion. Some visitors may be slightly annoyed at the noisy intrusion, while others may be more deeply upset. Some visitors may be intrigued by the helicopter and accept it as part of the "Alaska" experience, in much the same way as fixed-wing aircraft.

When hiking, riding horses, or bicycling in and around the Kantishna Hills, some visitors' experience would occasionally be disrupted by the sudden appearance of a helicopter flying low over a ridge or by noisy heavy equipment traveling a common roadway. Encountering survey markers, air photo panels, brush trimmed for survey lines and smoke from debris burning may also diminish a visitor's park experience. To a visitor expecting a quiet hike in a remote park environment, the distant helicopter, heavy equipment and other visual intrusions may destroy their sense of remote solitude. In contrast, some visitors may be supportive of the program goals and thus be more willing to accept the short-term intrusion for the long-term park resource protection benefits.

Some of the positive long-term benefits of the reclamation program which would facilitate the visitor experience include: 1) non-historic trash and debris removal to improve the aesthetics of some backcountry areas; 2) improvement of former mining claims to provide additional park lands for public use; 3) removal and disposal of hazardous substances and treatment of oil-stained soils to eliminate potential park resource degradation and hazards to wildlife and site visitors. Businesses which provide visitor facilities in the Kantishna Hills area would generally bear the burden of soothing irritated visitors who become upset over a disruption of their Kantishna visit by NPS operations. Visitors may leave early or fail to return for a subsequent visit because their expectation of a remote wilderness experience was not achieved. However, it is believed that if the vast majority were knowledgeable of the program goals, they would not alter their plans based solely on an encounter with NPS equipment operations during their visit.

The impacts to park visitors are dependent upon when they visit, how long they stay and where they stay. The visitor most likely to encounter some element of NPS reclamation operations in the Kantishna Hills would be one who stays in a Kantishna area lodge for two or more nights when debris cleanup or reclamation activities are taking place. For that visitor, an additional level of noise and visual intrusion may be experienced above background levels created by frequent private aircraft overflights, lodge generators and general Kantishna area road traffic. NPS operations would contribute to cumulative impacts in the form of occasional helicopter overflights, infrequent heavy equipment travel on the local Kantishna road system and chance encounters with heavy equipment on Skyline Drive or along Moose Creek. For other visitors, backcountry contacts with crews or equipment are unlikely, but helicopter overflights would occasionally be visible, as are small private airplanes.

Cumulative Effects: While reclaimation projects would be in progress they would contribute the majority of effects to visitor use. As they ceased the impacts from this source would greatly diminish. The total cumulative impact to an individual visitor increases with their length of stay. The magnitude of the impact is dependent upon individual visitor sensitivity to human generated intrusions. In most cases a visitor is likely to interpret the level of noise and general activity as representative of the Kantishna area for the time of their visit.

Conclusion: Overall, short-term adverse impacts to park visitors and recreation resulting from stream and mine reclamation projects are considered to be minor. The long-term positive benefits of restoring previously disturbed habitat outweigh the short-term disruption and annoyance of some individual visitors. The level of impacts to recreation and visitor use anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Park Management

Park managers are directed by several important park and agency management guidelines, policies and regulations, including the Record of Decision for the Final Environmental Impact Statement on the Cumulative Effects of Mining, the Denali General Management Plan, and others, to conduct a reclamation program on mining claims. This plan would result in compliance with those policies and regulations. Therefore, park management would be held in

high regard by concerned citizens, environmental groups, some lawmakers, and others who want to see the former mining claims in Kantishna reclaimed. Some private business owners in Kantishna may appreciate this action by park managers; others may be upset with park management because of increased heavy equipment operations and associated impacts to their paying guests.

Conclusion: This plan would result in compliance with important park and agency management guidelines, policies and regulations, the overall impacts to park managers are seen as positive.

ALTERNATIVE 2 – NO ACTION

Water Quality

Unreclaimed channels and floodplains would continue to have long-term negative impacts on water quality. Because bank erosion would continue to occur in unreclaimed stream channels, turbidity and excessive sediment would continue to exceed the normal levels found in undisturbed stream systems. Non-point source sediment loading from runoff over disturbed areas would continue. Occasional access along Moose Creek, Caribou Creek and other creek roads would continue, with use by inholders, and NPS scientists conducting research in the area. This would require occasional creek crossings with rubber-tired trucks. Such crossings disrupt small amounts of stream sediments and wash dirt off vehicle tires, tracks, and undercarriages. This causes a small sediment plume to form behind the vehicles and a temporary and localized increase in turbidity to occur.

Frequent vehicle use at the crossings would also results in some stream bed compaction, depressions and bank alterations. Experience shows that the in-stream impacts are quickly mitigated by stream dynamics.

Cumulative Effects: Previous mining activities would result in the majority of impacts to water quality. Unreclaimed channels and floodplains would continue to have long-term negative impacts on water quality. Bank erosion would continue to occur in unreclaimed stream channels, turbidity and excessive sediment would continue to exceed the normal levels found in undisturbed stream systems. Occasional vehicle use by inholders or park staff to the area via stream crossings would mobilize stream sediments causing localized increases in turbidity.

Conclusion: Overall, the long-term adverse impacts on water quality resulting from previous mining activities would continue. The level of impacts to water quality anticipated from previous mining activity would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Wetlands and Floodplains

Wetlands that have recovered naturally in mined areas would continue to recover, though at a much slower rate than if they were assisted by active reclamation. Total wetland acreage would be much smaller in the future. Floodplain function would not be restored in many areas. In

some areas, stream channels would continue to erode, which would result in continued bank erosion.

Cumulative Effects: Previous mining activities have resulted in the majority of impacts to floodplains and wetlands in the Kantishna area.The reestablishment of wetlands and floodplains through natural processes would provide the necessary life requisites for many forms of ecological function. Natural reestablishment would occur at a slower rate over a long period of time.

Conclusion: Overall, the adverse impacts on wetlands and floodplains resulting from previous mining activities would continue for a long duration of time. Some new wetlands may be reestablished through natural processes, though floodplain function would probably not. The level of impacts to wetlands and floodplains anticipated from the no-action alternative would be an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Vegetation

Vegetation that is recurring unassisted on mine tailings would continue. In the same fashion, natural processes would allow for limited revegetation of some mined and stripped floodplains which still contain organic soils. Floodplain revegetation would occur on a slow pace. Estimates place unassisted revegetation at 10-50 years slower than assisted revegetation. However, in watersheds with unstable channel conditions, erosion would continue on these systems, resulting in the continued loss of established and new vegetation. Vegetation that has reestablished on steep slopes would also be in danger of being destroyed through erosion. Some mined areas that have no organic soil or overburden would never revegetate.

Cumulative Effects: Previous mining activities have resulted in the majority of impacts to vegetation on the subject watersheds in the Kantishna area.The natural reestablishment of vegetation would provide the necessary life requisites for many forms of ecological function. That reestablishment would occur at a slow rate (10 to 50 years).

Conclusion: Overall, the adverse impacts on vegetation resulting from previous mining activities would continue for a long duration of time. Some new vegetation may occur through natural processes, though erosional processes would continue to threaten revegetation areas. The level of impacts to vegetation anticipated from no-action alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Wildlife

Wildlife habitat in the proposed project areas has been altered primarily by past mining activities that include destruction of wetlands and floodplains, loss of terrestrial and riparian vegetation . These long-term adverse impacts to wildlife habitat would continue under the no-action alternative. Impacts to riparian wildlife habitat would continue; recovery to wildlife habitat

would occur at a slow pace. Estimates place unassisted revegetation at 10-50 years slower than assisted revegitation.

Cumulative Effects: The total long-term impacts to wildlife would be greater under this alternative, because of the long-term impacts to wildlife habitat, which would not be actively restored.

Conclusion: Overall, the adverse impacts on wildlife and wildlife habitat resulting from previous mining activities would continue, including loss of habitat. The level of impacts to wildlife anticipated from no-action alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Fisheries

Minor short-term impacts would occur under this alternative, as well as long-term impacts. Aquatic life would continue to be impacted, and recovery to aquatic life habitat would be much slower than assisted rehabilitation. Because stream channel erosion would continue under this alternative, reduction of fish populations would occur due to the cementing of channel bed interstitial spaces with fine sediment. New fish habitat would not be constructed. Habitat such as pools, overhanging banks and others would develop naturally in some channels, but not develop in other unstable channels.

Cumulative Effects: Previous mining activities have resulted in the majority of impacts to fisheries on the subject watersheds in the Kantishna area. Long-term impacts would continue under this alternative because new fish habitat would not be constructed and channels would not be stabilized.

Conclusion: Overall, short- and long-term adverse impacts to fisheries and fish habitat resulting from past mining activity from the no-action alternative would continue The level of impacts to fish and fish habitat anticipated from no-action alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Cultural Resources

Accidental disturbances to unmapped cultural resources by heavy equipment would not occur. It is possible that in some areas, known cultural resources may be at a greater risk of destruction due to channel erosion.

Cumulative Effect: The contribution to cumulative impacts to cultural resources from the no-action alternative would be considered inconsequential. There may be minor long-term adverse impacts to cultural resources that would be destroyed by eroding stream channels.

Conclusion: Overall, the low likelihood of impacts on cultural resources resulting from this alternative would be minor.

Visitor Use and Recreation

Long-term negative impacts would be experienced by park visitors who feel that mining debris, tailing piles, unstable streams, and other effects of mining should be cleaned up and reclaimed within a national park unit. These visitors' experience would be disrupted by the site of such mining-related disturbance

Cumulative Effect: The cumulative case effects would be the same as identified for the preferred alternative.

Conclusion: The long-term adverse impacts of not restoring previously disturbed habitat would affect some visitors who feel that the duty of the National Park Service is to restore ecological function to disturbed areas. The level of impacts to visitor use and recreation anticipated from no-action alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

Park Management

Park managers are directed by several important park and agency management guidelines, policies and regulations, including the Record of Decision for the Final Environmental Impact Statement on the Cumulative Effects of Mining, the Denali General Management Plan, and others, to conduct a reclamation program on mining claims. This alternative would result in non-compliance with those policies and regulations. Therefore, park management would be held in low regard by concerned citizens, environmental groups, some lawmakers, and others who want to see the former mining claims in Kantishna reclaimed. Some private business owners in Kantishna may appreciate the no-action alternative, so guests won't be disturbed by heavy equipment operations.

Conclusion: As this alternative would result in non-compliance with important park and agency management guidelines, policies and regulations, the overall impacts to park managers are seen as negative.

Summary: The no-action alternative would increase the likelihood of continued bank and bed erosion along the stream channels. Floodplain revegetation would occur on a much slower pace. Estimates place unassisted revegetation at 10-50 years slower than assisted revegetation. Some areas that might revegetate naturally would be subject to erosion, as large floods would continue to disturb streams that are not in equilibrium. Non-point source sediment loading from runoff over disturbed areas would continue. Aquatic life would continue to be impacted, and recovery to aquatic life habitat would be much slower. Impacts to riparian wildlife habitat would continue; recovery to wildlife habitat would be much slower. There would be no impacts to subsistence users under this alternative. The impacts of this alternative would be similar to those addressed in the Final Environmental Impact Statement on the Cumulative Impacts of Mining in Denali National Park and Preserve (NPS, 1990). The no action alternative would be in direct

conflict with the NPS's stated intentions to implement a mining reclamation program for Denali National Park and Preserve.

The no-action alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or key to the natural or cultural integrity of the park.

CONSULTATION AND COORDINATION

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APPENDIX A: INVENTORY OF MINE RECLAMATION SITES

An inventory of disturbance based on field work and aerial photographs has been completed for the Kantishna Hills. The following list provides a summary of the level of disturbance in each watershed and recommended actions for reclamation and restoration. Detailed information for developing site plans and environmental compliance is available in the Environmental Overview and Analysis of Mining Effects (NPS, 1981), the Final Environmental Impact Statement: Cumulative Impacts of Mining (NPS, 1990), and in An Overview and Assessment of Archeological Resources, Denali National Park and Preserve, Alaska (Griffin, 1990).

Individual site plans will be developed based on all available information, with additional field work as necessary. Constraints such as land ownership and funding must be considered. In larger watersheds such as Caribou Creek it may be more appropriate and more practicable to implement site plans in the upper section or sections first and reclaim downstream areas later.

1) Eldorado Creek

Upper section of watershed (Slate Creek) NPS owned
Lower section of watershed: private unpatented mining claims

Present Condition: Extensive placer and lode mining has been conducted throughout this drainage. Mining on the Liberty claims along Eldorado Creek continued into the 1980s. An access route runs the full length of Eldorado Creek, crossing the stream over 20 times. It continues as a rough trail to upper Slate Creek. North of the main section of Eldorado Creek on Alpha Ridge are the former Virginia City lode claims. Disturbance includes non-historic structures, some test pits, and tailings piles.

A two-year reclamation project (1997-98) in upper Slate Creek, focused on treating the abandoned mine drainage and improving the drainage away from the mined area. An anoxic limestone drain was constructed on-site to treat the acid mine drainage. Approximately 300 feet of upper Slate Creek received bank stabilization treatments, including the use of coir bio-logs and fabric-encapsulated soil lifts. Finally, 1,000 alder seedlings were planted around the mine site area. However, access issues during the second year of the project prevented heavy equipment from finishing the original earthmoving plan.

Recommended Action: Major reclamation projects will be necessary in two areas of the watershed:
1) The mouth of Eldorado Creek, which can be rebuilt in conjunction with reclamation on lower Moose Creek, and
2) Upper Slate Creek, which requires additional recontouring, reshaping tailings piles and settling ponds, and stream rehabilitation before revegetation work can be done.

The track on lower Eldorado Creek to the Comstock cabin should not be maintained. Light visitation can be expected and therefore this former access route may not recover completely. However, preservation of the Comstock cabin should be incorporated into overall interpretive planning for the Kantishna Hills. The former trails on upper Eldorado Creek and along Slate Creel as well as those connecting to the ridgetop airstrip should be allowed to recover naturally. Some stabilization may be required in a few places.

Test pits in the watershed will be filled in. While non-historic structures are to be removed, the Comstock cabin should be stabilized and secured if necessary. The hillside adits and tailings

piles will be left to deteriorate in place. Natural recovery is adequate for other disturbances related to the Comstock camp such as the hillside access road.

2) Upper Moose Creek

Mixed ownership

Present Condition: An access road from the main road to Kantishna begins near the North Face lodge and follows Moose Creek to its confluence with the North Fork and up to the mouth of Spruce Creek. There were large placer mining operations along upper Moose Creek as recently as the 1980s and some moderate tailings piles remain. Two vehicles and other debris can be found near the access road.

Recommended Action: Use of heavy equipment may be necessary near the access road along upper Moose Creek to reshape tailings piles, fill in large linear pits, and stabilize former roads. Revegetation work will be adequate along several of the former tracks that are no longer used, assuming these tracks are stable. The main route should be retained for pedestrian visitor use and inholder use (Rainy Creek, Glen Creek, Spruce Creek).

3) Lower Moose Creek

Mixed ownership

Present Condition: Lower Moose Creek has been substantially disturbed by mining activities since 1905 and by concentrated visitor use. Large areas of riparian vegetation and wildlife habitat have been destroyed. In place are numerous access roads, tailings piles, parking areas, and on-going construction sites. There are several patented claims on lower Moose Creek, some of which had title transferred to the U.S since 1980. Relatively new structures include the Kantishna Roadhouse and the Denali Backcountry Lodge.

Recommended Action: Major reclamation (assuming NPS acquisition of adequate land along lower Moose Creek) would include reshaping tailings piles near the streams and rehabilitating the floodplain. The lower end of Eldorado Creek would be replaced in its former channel in conjunction with Moose Creek reclamation. Topsoil may need to be imported for some areas and revegetation may require active assistance.

4) Spruce Creek

Mixed ownership

Present Condition: There are 6 unpatented and 2 patented placer mining claims on Spruce Creek, some of which were mined as recently as 1980. An access road follows Spruce Creek all the way from the North Fork of Moose Creek to the upper claims (#7 and 8). Spruce #4, a patented claim, was mined extensively in 1975. There are some buildings along with miscellaneous equipment and debris on the patented claims (#4 and #5). Spruce #4 is a 20-acre inholding; current NPS negotiations are aimed at purchasing 18 acres in fee and development rights on two, one-acre parcels.

Recommended Action: Substantial reclamation, including leveling tailings piles and stream re-contouring, is necessary on the lower half of the stream, including Spruce #4. All buildings and miscellaneous equipment and debris should be removed. Because these items have minimal value, it is unlikely that the claim owner would be interested in relocating them, so removal may become part of the site plan for reclamation. Some restoration work may be necessary on the access road.

There are small areas on the upper claims that may require minor re-shaping. Upon completion of all re-shaping work on the entire drainage, some revegetation work may be necessary as well. All reclamation work should be completed as one project since the Spruce Creek watershed is relatively small and since most disturbance is concentrated in one area.

5) Rainy Creek

Mixed ownership

Present Condition: There are 2 patented and 6 unpatented placer mining claims on Rainy Creek. Claims #3 and 5 were mined with heavy equipment in the early 1980s. There is an access road from Moose Creek to the lower end of Claim #6. Although no buildings remain on unpatented land, miscellaneous debris is scattered through the lower section. Acquisition by the NPS is complicated by title problems, litigation over ownership, and hazardous substances.

Recommended Action: Hazardous materials remediation on Claim #5 will be the first priority once the claims are acquired by the National Park Service. Reclamation work will then be required on Claims #3 and 5, involving stream and floodplain rehabilitation and minor reshaping along the benches in some locations. The access road would be retained as long as patented properties exist upstream.

6) Upper Glen Creek

Non-NPS Owned

Present Condition: The Glen Creek research watershed has been a major part of the region-wide reclamation program. Demonstration projects and revegetation research have been conducted in the lower reaches of Glen Creek beginning in 1988. Acquisition of claims in upper Glen Creek has therefore been a high priority. However, purchase of these unpatented claims, Gold King 1-15 (over 266 acres) and Silver King 16 and 17 (40 acres), is being complicated by litigation and bankruptcy. Research and monitoring will continue on lower Glen Creek, and may include additional channel and floodplain reshaping.

The upper section, including both the East and West Forks, was mined with heavy equipment and without any reclamation efforts until the court injunction in 1985. Over three miles of narrow floodplains have been disturbed. There is a large camp and a substantial amount of mining equipment and miscellaneous items requiring relocation. Substantial hazardous substances mitigation needs have also been identified on the claims (Dames and Moore, 1992). Hazardous materials are concentrated near the camp and surrounding area, except for a pile of concentrated sands which contained mercury located near the cabin in Claim #12.

Recommended Action: Once the NPS acquires this property, the entire upper drainage of Glen Creek should be reclaimed as one large project. where reclamation is required almost to the stream headwaters. Even outside the floodplains, there are several access roads that have recently

been used by heavy equipment and may require stabilization and re-planting. This is also the case for a switchback road on the side of a steep slope above the West Fork (Silver King Claims #16 and 17, and for the airstrip near the main camp (Claim #6). When reclamation and restoration of upper Glen Creek nears completion, the access road from Moose Creek should be restored, beginning at the upper end.

7) Caribou Creek

NPS Ownership

Present Conditions: In upper Caribou Creek, there is an access road in the floodplain for the full length of the claims. A two thousand foot airstrip is also located within the floodplain. The channel is incised and straightened by oversteep tailings piles that form the access road.

In middle Caribou Creek, the lower claims were partially reclaimed by re-contouring and replacing topsoil. The creek is incised in some nearby stretches, and there are remnants of access routes along the creek and on the adjacent benches. Historic dredge tailings are somewhat stable, and have been invaded by opportunistic plant species, especially alder.

On lower Caribou Creek, most areas along the stream were not reclaimed, resulting in barren areas with neither topsoil nor vegetation and with large tailings piles. There are scars from former access routes across the nearby ridges and along the stream.

Recommended Action: Additional work is necessary to stabilize Caribou Creek. The channel and floodplain should be reconstructed to a stable hydraulic configuration. Tailing piles must be recontoured or blended into the side of the valley walls. More than 4.5 miles of the floodplain and channel will require rehabilitation because of the incised stream and slumping banks. When reclamation is completed, feeder routes should be closed and rehabilitated so there is no connection to Caribou Creek. The final step would be to rehabilitate the steep section of the Skyline Drive access route and close it to wheeled vehicles. Planting and fertilization may be necessary.

8) Glacier Creek

NPS ownership

Present Condition: Upper Glacier Creek. This section of the watershed includes the headwaters in McGonagall Gulch and a major tributary, Yellow Creek. Yellow Creek is affected by a former access road from Skyline Drive as well as past placer mining. Recent court ordered mining sampling has also resulted in new disturbances from heavy equipment and large sampling holes. The result is over a mile of disturbances in this narrow floodplain, with loose tailings piles and loss of riparian vegetation. The main channel of Glacier Creek has been somewhat disturbed by placer mining on the Little Audrey claims downstream from the mouth of Twentytwo Gulch. The stream is incised in some places on those former claims.

Middle Glacier Creek. There are two nodes of mining activity in this area, with an airstrip and an assortment of buildings on each. Former access routes connect these two camps to each other and to the abandoned routes across the tundra. Over a mile of the middle section of Glacier Creek has been intensively mined without reclamation, leaving tailings piles, an unstable stream, and stripped areas that are slumping and eroding.
Recommended Action: In upper Glacier Creek, the former road along Yellow Creek will need to be reclaimed and the stream channel rehabilitated. Some reshaping of tailings may be necessary. Subsequent planting may be required to reestablish riparian vegetation. Disturbances in

Twentytwo Gulch will need to be restored and former tailings areas revegetated. Traces of the former access road along upper Glacier Creek may need to be stabilized and restored in places where natural recovery is inadequate. In middle Glacier Creek, the tundra trails near the stream need to be rehabilitated, as does the floodplain. Tailing piles need to be recontoured.

9) Friday Creek

NPS ownership

Present condition: Much of the two miles of stream channel has been physically altered by booming, which occurred as recently as 1978. The streambed is very rough and coarse, while the banks on the lower portion of the watershed are steep. There have been up to 2 miles of access routes constructed, contributing to the 5 overall acres of disturbance to riparian vegetation. Recent court ordered mining sampling resulted in fresh and substantial disturbance to the stream channel and access road to the upper section. The lower floodplain near the main road was thoroughly mined in the early 1980s, and has been flattened and utilized for an NPS work camp area.

Recommended Action: Some tailings at the upper end of the disturbed floodplain will require re-shaping. The stream channel will need to be rehabilitated on the south side of the upper disturbance. Reshaped tailings will require planting. The entire stream length should be checked for areas subject to erosion and stabilized where necessary. The former access road along the stream should be closed at the lower end and restored. Natural recovery may be adequate along much of the former road and in the lower section of the floodplain.

10) Eureka Creek

NPS owned

Present Condition: The Eureka Creek watershed has been extensively mined since the first stampede to the Kantishna Hills. Little of the original channel remains in the disturbed reaches. In most places the entire valley floor has been mined and the stream flows through placer tailings and over access trails. The stream is straight with little vegetation in some areas. In other areas, riparian vegetation is returning slowly. In lower Eureka Creek, an NPS reclamation project in 1999 removed several tons of debris and hazardous waste, and reshaped the straightened stream channel into a sinuous, functional channel/floodplain system. Bio-engineering was used on the outside corners to stabilize the stream until revegetation occurs. In areas upstream (mid-Eureka), some tailing piles with fine materials are supporting revegetation, including fireweed, willow, and alder. Others composed primarily of coarse rock are bare. There are some former testing locations and resulting disturbance scattered throughout the watershed. Portions of a former access route can be found most of the way along the stream. The upper reach of Eureka Creek near Lucky Gulch is a moderately disturbed area with some historic cabins and ditch lines. The middle section of Eureka Creek, just upstream of the Iron Gulch trail, has been affected much more by mining activities.

Recommended Action: Moderate earth work and redistribution of overburden piles with some assisted revegetation could improve this drainage. Tailings along the floodplain would be reshaped and revegetation assisted by planting and fertilizing. Slopes on which mining disturbance is contributing to erosion would need to be stabilized. Some areas in which natural revegetation and recovery is occurring should be avoided and left as is.

11) Crooked Creek

NPS ownership

Present Condition: This watershed north of Stampede Creek has been disturbed by historical hydraulic mining. Remains of three cabins and a cache are located just above the floodplain, and a former airstrip on a high bench above the stream is overgrown with alder. Drums were removed from this area during summer 1994. Other debris and tailings piles remain near the stream.

Recommended Action: After reshaping tailings piles with hand tools, minor restoration, especially assisting with revegetation, may be necessary. Natural recovery should then be adequate.

12) Quigley Ridge

NPS, non-NPS ownership

Present Condition: Major disturbance areas on Quigley Ridge and along Skyline Drive, a mining access route to Caribou Creek built in 1983, include the Red Top road and several other overgrown spur roads to former mine sites. Tailings piles, collapsed adits, test pits, and access trails are scattered throughout the area.

Recommended Action: Initial evaluation of Quigley Ridge/Skyline Drive disturbance shows that most of the lode mine tailings are fairly stable at the angle of repose, but almost no natural revegetation has occurred. All spur roads will be closed at Skyline Drive, on which vehicular traffic will eventually be phased out. Spur roads can be stabilized in part by pulling some tailings materials into the road cuts and reduce slopes on unstable sides if necessary. Natural recovery can then be allowed. All non-historic structures, abandoned equipment, and debris will be removed from the Quigley Ridge/Skyline Drive area. Adits and tunnels will be made safe by sealing them. Scattered tailings piles may require re-shaping and assisted revegetation. The access road to Red Top mine should be closed and restored, with revegetation of this former route and former building site. The Skyline Drive/Glacier Peak road will be stabilized as necessary to prevent erosion that would affect other areas, especially streams. The route will be closed to all vehicles past all patented claims, but continuing use by mountain bikes has been approved in the 1997 FCEIS.

APPENDIX B: FLOODPLAINS AND WETLANDS

Executive order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands, have been considered in this environmental assessment. Executive Order 11990 directs the NPS to: 1) provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands; 2) to preserve and enhance the natural and beneficial values of wetlands, and 3) to avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands. In addition to adopting a goal of no net loss of wetlands, the NPS will strive to achieve to longer-term goal of net gain of wetlands. Implementation of the Denali Reclamation of Mined Lands Program, as discussed in this EA, will result in a net gain of wetlands in the Kantishna Hills area of Denali National Park and Preserve. Though some smaller wetlands areas will be impacted by earthmoving activities, it is expected that the benefit of rehabilitated and newly created wetland areas will
far outweigh the impacts from construction-related wetlands disturbance. Alternative 1, the proposed action, is excepted from a Floodplain Statement of Findings.

Executive Order 11988 directs the NPS to restore and preserve natural floodplain values, and to avoid the long and short-term environmental impacts associated with the occupancy and modification of floodplains, and avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In the project areas listed in Appendix A, floodplain modification occurred during the mining process. The reclamation actions described in this EA should serve to restore the proper geometry and function to affected floodplains, and thus restore and preserve the natural floodplain values. All impacts to floodplains resulting from these actions will be beneficial and in direct support of Executive Orders and NPS policies. Alternative 1, the proposed action, is excepted from a Wetlands Statement of Findings.

On individual projects, the Regulatory Branch, U.S. Army Corps of Engineers, Alaska District, will be contacted in order to determine permit requirements to protect wetlands within the authorities of Section 404 of the Clean Water Act of 1977. It is expected that Nationwide Permit #27 will be utilized for most, if not all, projects involving disturbance of on-site wetlands.

APPENDIX C: SUBSISTENCE SECTION 810 (a) SUMMARY EVALUATION AND FINDINGS

I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluation of potential restrictions to subsistence activities that could result from the reclamation of mine sites in the Kantishna Hills area of Denali National Park and Preserve.

II. THE EVALUATION PROCESS

Section 810(a) of ANILCA states:

> "In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands . . . the head of the federal agency . . . over such lands . . . shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency -
>
> (1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;
>
> (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and
>
> (3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the National Park System in Alaska. Title II of ANILCA established and created additions to national parks for the following purposes:

> "(a) In order to preserve for the benefit, use, education and inspiration of present and future generations certain lands and waters in the State of Alaska that contain nationally significant natural, scenic, historic, archeological, geological, scientific, wilderness, cultural, recreational, and wildlife values...
> (b) ...to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat

for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large arctic and subarctic wildlands and on freeflowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.

(c) ...consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so."

The potential for significant restriction must be evaluated for the proposed action's effect upon ". . . subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use."

III. PROPOSED ACTION ON FEDERAL LANDS

The proposed action is to conduct mine reclamation activities according to regulations promulgated under the Mining in the Parks Act of 1976 and implement the decision of the Final Environmental Impact Statement of Cumulative Impacts of Mining in Denali National Park and Preserve in the Kantishna Hills area of Denali National Park and Preserve during the summer seasons of 2001-2010. The purpose of this action is to restore a more natural appearance to the disturbed drainages, and assist natural revegetation by eliminating abandoned equipment, buildings and debris used in past mining activities, recontouring washed gravel and boulder (tailings) piles, reconstructing channels and floodplains to restore the original flood capacity and function, redistributing available topsoil and fines, and planting native plants from park sources over the reclaimed areas. Recontouring of tailings piles, and reconstruction of stream channels and floodplains may involve the alteration of the existing active stream channel. This is necessary to encourage aquatic habitat recovery by stabilizing stream banks and providing cover for grayling and a food source for both aquatic and terrestrial insects. Reestablishment of floodplain vegetation in the Kantishna Hills would also provide habitat for a variety of birds and small and large wildlife. In support of that effort, several small field camps would be utilized in the watersheds where reclamation efforts are occurring. These sites will probably include upper Caribou Creek, lower Caribou Creek, upper Glen Creek, Friday Creek, and others in the Kantishna Hills area. These camps would provide support to field activities. The Friday Creek camp would act as a base camp for summer operations in Kantishna; the other camps would act as smaller 'spike' camps, to be temporarily operational only during specific reclamation activities projects, and located in the project area

IV. AFFECTED ENVIRONMENT

The area involved in the proposed action has been inventoried previously to document vegetation, wildlife, cultural resources, and other parameters. Data on this and the surrounding environment is included in the 1990 Denali Cumulative Impacts of Mining FEIS and the 1997 Entrance Area and Road Corridor Development Concept Plan/EIS.

This section reviews the subsistence background and resources of the Kantishna area. This area is open to subsistence hunting, fishing, and gathering pursuant to Section 203(3)(a), ANILCA. A thorough study of the affected environment is detailed in "Environmental Overview and Analysis of Mining Effects, Denali National Park and Preserve", National Park Service, September 1981. A recent detailed history of subsistence patterns and uses can also be found in "Land Use in the North Additions of Denali National Park and Preserve: An Historical Perspective", NPS Research/Resource Management Report AR-9, 1984. Further information can also be found in Richard Bishop's work, "Subsistence Resource Use in the Proposed North Additions to Mt.McKinley National Park", 1978.

Hunting and fishing, which were the major subsistence activities in the Kuskokwim and Tanana River watersheds prior to the turn of the 19th century, gave way to increased reliance on trapping during the first quarter of the 20th century. Trapping allowed for trade of manufactured goods with miners, who, by the 1930s, had for the past 25 years been inhabiting the area. During this time, for a variety of reasons, game had been depleted significantly, resulting in native subsistence relying more heavily on fishing and trapping than on mountain hunting trips to the Alaska Range. During this period, subsistence use was increasingly practiced by miners and prospectors, with other users gathering meat for sale to the Kantishna mining camp.

Nearly all subsistence use, however, was north or west of the Kantishna area. Charles Sheldon, writing in a 1930 book, The Wilderness of Denali, stated that in the 1906-1908 period that "[s]ome time ago the Indians abandoned all their trapping grounds on the upper parts of these rivers [upper Kuskokwim and Kantishna]...The Indians never hunted the upper reaches, having always found game abundant enough below to satisfy their needs."

Denali National Park and Preserve has a total of about 320 eligible local rural residents who qualify for subsistence use of park and preserve resources. Subsistence users for the ANILCA park additions primarily reside in the communities of Cantwell, Minchumina, Nikolai, and Telida. Other local rural residents who do not live in these designated resident zone communities, but who have customarily and traditionally engaged in subsistence activities within the park, may continue to do so pursuant to a subsistence permit issued by the park superintendent. Individuals from McKinley Village, Nenana, Healy, and Tanana have received subsistence use permits.

Currently there is limited subsistence hunting activity in the Kantishna area. A subsistence moose season from September 1-30 attracts one to three families per season

from Cantwell with an average of less than one moose taken each year. Areas within one mile of the park road are off limits to firearms discharge for the first half of the season.

A Nenana family runs a trapline into the Bearpaw drainage, 24 miles north of Kantishna. People from Minchumnia trap into upper Slippery Creek, 15-20 miles west of Kantishna.

V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources that could be impacted.

The evaluation criteria are:

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in numbers; (b) redistribution of subsistence resources; or (c) habitat losses;
- what affect the action might have on subsistence fisher or hunter access;
- the potential for the action to increase fisher or hunter competition for subsistence resources.

1) The potential to reduce populations:

a. Ungulates

Both caribou and moose calve in late May and early June in the Kantishna area, although caribou generally calve further south before beginning their summer migration south across the park. Floodplain moose habitat would not be diminished by the projects, and in fact would only be improved. Caribou could be impacted as the general area is important to them as a pre-rutting, rutting, and wintering area. However, most caribou activity generally falls south of the study area. Heavy equipment operation, traffic, human noise and occupation, and human contact could possibly cause a temporary redistribution of wildlife away from one watershed area and into the next..

There is no open season for any hunting of Caribou within State Game Management Unit 20(c), which includes the Kantishna area.

b. Predator mammals

Both grizzly and black bear, as well as wolves, inhabit the Kantishna area in general. Wolves could be temporarily affected since the home range of the Little Bear wolf pack, (currently numbering approximately 10-15 in population, roughly corresponds to the area of the Kantishna Hills (Meier et al, 1992). Bear would be less affected other than possibly by alteration of travel routes, which could include intrusion into the operations area or the human camp area. Such intrusion could possibly result in a reduction in the population from human/bear encounters (defense of life and property).

c. Furbearers

Few furbearers could be subjected to local redistributions because of disturbance from increased human activity in the area. Any displacement of small mammals to other areas can result in changes in the food chain for neighboring areas.

d. Fish

Compared to other parts of Alaska, fish species are relatively sparse in the southern Kantishna area. Area creeks, in an undisturbed state, are clear- flowing streams. No impacts to fish species or habitat are expected from this proposal.

e. Summary

The slight disturbance to moose and furbearers would be highly localized and not affect the species populations as a whole. The proposed action would not manipulate subsistence habitats or result in significant reduction in, or redistribution of, subsistence resources.

2) Increase in Competition:

The proposed reclamation project areas are within the National Park additions where sport hunting is prohibited. No increase in the number of qualified subsistence users is expected to result from contract crusher operators living in the area seasonally. Therefore, no increase in competition for subsistence is foreseen.

The proposed action would not produce any increase in competition for resources to subsistence users from sport hunters and fishers. Subsistence users would not be adversely affected by competition from other resource users.

If and when it is necessary to restrict taking, subsistence uses are the priority consumptive uses on public lands of Alaska and will be given preference on such lands over other consumptive uses (ANILCA, section 802(2)). The National Park Service would continue to cooperate with the Alaska Department of Fish and Game in supporting the latter's wildlife management measures concerning bag and open season limits to protect the continued viability of all wild renewable resources in Alaska (ANILCA, section 802(3)).

3) Restriction of Access:

There will be no restrictions from reclamation activities for access to subsistence resources.

No actions under Alternative 1, which are described in detail in the Description of the Alternatives section, should affect the access of subsistence users to natural resources in the park/preserve for subsistence.

VI. AVAILABILITY OF OTHER LANDS

These activities can only occur on mined areas in the Kantishna Hills. As such, they cannot be transferred to other lands which do not support subsistence activities.

VII. ALTERNATIVES CONSIDERED

One alternative to the proposed action is evaluated. The no-action alternative is not preferred because it does not provide for mine reclamation and subsequent restoration of wildlife and fisheries habitat disturbed by mining.

VIII. FINDINGS

This analysis concludes that the proposed action would not result in a significant restriction of subsistence uses.